How Should We Screen for Coronary Disease?

NASCI Workshop 10/5/2009

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Annotated Bibliography

The literature on imaging in screening for coronary disease is immense. I have listed some articles to help you form a basis for further reading. Many of these will be referred to in my talk.

Traditional risk factor analysis

Clinicians and researchers alike frequently follow the clinical guidelines from the following work:


An update was published in 2004:


The Framingham risk score and additional risk factors are used to stratify the risk of a coronary event, which is used in turn to adjust the aggressiveness of statin therapy. A higher risk assigns a lower target LDL value.

Scientific statements from various official bodies

The American College of Cardiology frequently publishes these “scientific statements” usually in conjunction with other organizations like the AHA. They are consensus documents from leaders in the field that weigh the current evidence and make specific recommendations on a variety of topics, in this case imaging in coronary disease.


A similar NASCI statement synthesizes much of the information on calcium scoring in the ACC statements but is more recent and easier to read:


United States Preventative Services Task Force

The United States Preventative Services Task Force periodically reviews the evidence for health screening and other public health measures. Presumably their recommendations carry some public policy weight. Their latest for coronary screening was in February 2004:


Excerpts:

“...The U.S. Preventive Services Task Force (USPSTF) recommends against routine screening with… electron-beam computerized tomography (EBCT) scanning for coronary calcium for either the presence of severe coronary artery stenosis (CAS) or the prediction of coronary heart disease (CHD) events in adults at low risk for CHD events. In the absence of evidence … [of] improved health outcomes, and because false-positive tests are likely to cause harm, including unnecessary invasive procedures, over-
treatment, and labeling, the USPSTF concluded that the potential harms … exceed the potential benefits.

Rating: **D Recommendation**” *This is their lowest rating.*

“The USPSTF found insufficient evidence to recommend for or against routine screening [beyond that obtained by ascertainment of conventional CHD risk factors]… in adults at increased risk for CHD events.

Rating: **I Recommendation**” *This means they found the evidence to be inconclusive.*

**Poor correlation between conventional risk factors and plaque burden**


**Calcium score adds to Framingham risk prediction – ROC analysis**

An important longitudinal follow-up with ROC analysis. Previous 3 year analysis by this group had shown no significant predictive gain from Ca++ scoring. This 7 year follow-up shows area under the ROC increases modestly from 0.63 to 0.68. Note that this does not demonstrate that the calcium score actually influences clinical outcome.


**Does screening with imaging influence patient compliance?**

Two different takes on the matter:


**Is low dose aspirin for primary prevention a good idea?**

This is a metaanalysis involving over 660,000 patients showing an increase in bleeding events without much benefit in preventing primary coronary events. (Note: Conventional practice as of this writing still seems to be in favor of aspirin however)

Antithrombotic Trialists’ (ATT) Collaboration. Aspirin in the primary and secondary prevention of

Promoting a leading role for imaging in risk stratification – the SHAPE paper


Absence of coronary calcium is associated with very low event rates


- calcium score <10 resulted in probability of mortality ~ 1.0% by the end of a 5 year follow-up


- only 0.4% of individuals with a negative calcium score died during almost 7 years of follow-up, compared to 3.3% of individuals with a positive calcium score

In summary: An opinion leader in a leading journal, September 2009


- his answer is basically no, until the value of imaging in preventing coronary events has been demonstrated