Calcium scores may be more meaningful in lower-risk patients

April 4, 2007 | Shelley Wood

New Orleans, LA - New recommendations for using coronary calcium scoring issued late last year concede that the imaging test may yield additional risk-stratification information in people in the "moderate-risk" category (10-year risk of CVD, 10% to 20%), according to Framingham score. But researchers applying the strategy in a population-based sample from the **Dallas Heart Study** (DHS) say this approach is highly inefficient and may miss patients in whom a coronary artery calcium (CAC) test might actually lead to important changes in management.

According to **Dr Mahesh Patel**, just 15% of men and only 1% of women among the 2610 subjects ages 30 to 65 in the DHS sample would even be categorized as moderate risk on the basis of Framingham score to begin with—a much lower proportion of patients than many clinicians might think. And of those in this intermediate category, just 1% or fewer would be bumped up to the high-risk category on the basis of a CAC screening test—ie, on the basis of a calcium score ≥400.

"The moderately high-risk strategy doesn't work at all for women, and it's very inefficient in men," Patel told **heart*wire***.

Patel presented results from the study last week during the **American College of Cardiology 2007 Scientific Sessions**.

More bang for buck with CAC

Patel and colleagues first categorized DHS patients who had undergone both Framingham risk analysis and CAC testing to assess the incremental value of CAC testing in people who fell within the Framingham 10%-20% 10-year risk. Since proponents of CAC scoring have proposed that calcium screening may have added value if the intermediate-risk group were expanded to include anyone with a 6%-20% 10-year risk, Patel et al also looked at the added benefit in this expanded group.

Numbers of patients eligible for and promoted on the basis of CAC

Group	10-y risk, by Framingham score (%)	Eligible for CAC (%)	Promoted to high-risk group on the basis of CAC (%)
Men, age 30-65	10-20	15.4	1.1
Women, age 30-65	10-20	1.0	<0.1
Men, age 30-65	6-20	29.8	2.5
Women, age 30-65	6-20	2.1	<0.1

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To ensure that the inclusion of younger, healthier subjects wasn't diluting the results, Patel et al also considered only men and women age 40 to 65, and the findings in terms of eligibility for screening and risk-group promotion were similar, he noted.

What about lower-risk patients by Framingham score?

Currently, Patel explained, only a CAC score of 400 or greater is used to "bump" moderate-risk patients into the high-risk category, a reclassification that would mean more aggressive prevention strategies, including lower LDL goals. But Patel and colleagues also addressed whether the Framingham risk score also underestimates risk in lower-risk subjects and whether it might also be useful to take CAC scores ≥100 into account. They report that for men with a 10%-20% risk score, 14 would be needed to identify one subject with underestimated risk (on the basis of a CAC score ≥400), but this would identify only 25% of the total population with CAC scores of 400 or greater. In women within the same Framingham

category, more than 100 would have to be screened to promote one woman to a high-risk group, meaning that only 0.3% of all women with ≥400 CAC would be identified. However, when subjects with a Framingham risk score of 6% to 9% were considered—so called "low-risk" patients, with a 10-year risk of CVD of <10%—*and* if a lower threshold CAC score was used (≥100) substantially fewer men (6.6) and women (3.5) would need to be screened to promote one subject to a higher-risk category, they report.

"That means, if I had a Framingham score of 6% but my CAC score was 101, that would be clinically relevant, my risk status would change," Patel explained to **heart*wire***. "That's important, because when you move from a moderate-risk group to a high-risk group, you'd qualify for a different treatment strategy, and the same goes for moving from lower risk to moderately high risk; you'd have different treatment goals. Your LDL goal would be lower and you'd also have an indication for aspirin at that point."

He continued, "In our eyes, this actually may have more clinical impact than moving from moderately high to high."

Patel and his coinvestigators conclude that, in contrast to current imaging recommendations, it may in fact be more "fruitful" to target lower-risk subjects with imaging strategies. To **heart*wire***, Patel acknowledged that expanding current indications for CAC scanning would be controversial and that other novel risk-stratification tools are needed to help pinpoint groups of people in whom an imaging test might be warranted. Cost-efficacy studies would also be paramount. Further research is also warranted to better characterize the low-risk group that might benefit: the 6%-9% risk group, by Framingham, was chosen somewhat arbitrarily, he noted.

"We're exploring other groups within that low-risk-by-Framingham category to see whether we can find a better way to kind of tease out which subjects seem to benefit from imaging," Patel said. He also cautioned: "This is just one study. We definitely would need further validation in other population based studies."

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[*HeartWire* > *Other News*; Feb 16, 2007]

Finally, AHA's coronary calcium and CT statement sees the light of day
[*HeartWire* > *Other News*; Oct 05, 2006]

New ACC appropriateness criteria guide use of CT, MR for cardiac indications
[*HeartWire* > *Other News*; Aug 11, 2006]