

Letter to the Editor

CT Scanning the Coronaries for Calcium – Why the Controversy?

Dear Editor,

Few recent topics in cardiovascular medicine have engendered as much debate as the now vexed issue of high resolution CT scanning of the coronary arteries for calcium, as a predictor of coronary disease risk. As presymptomatic detection of atherosclerosis is a vital and still unsolved problem in clinical practice, open discussion about this topic is very important. It is equally important, however, that clinical practitioners have a clear idea of the 'state of the art', in order to help guide management of individual patients.

The essential facts concerning coronary calcium scanning are not in dispute. Non-invasive tests to assist in risk stratification are clearly needed, for low and intermediate-risk patients. CT scanning can detect calcium in the coronary arteries and this is clearly a marker of the burden of atherosclerosis in the coronary circulation. If the coronary calcium score is '0', subsequent risk of events in the medium term is very low (although not zero) and if the calcium score is high, this clearly indicates not only the presence of extensive atherosclerotic plaque, but also improved risk prediction, compared with conventional risk factor assessment only.¹ Nevertheless, despite excellent *sensitivity* for disease, CT scanning for coronary calcium has much less good *specificity*, resulting in a high number of 'false positive' tests (in terms of predicting actual events). This may cause undue concern in asymptomatic subjects and can lead to a series of subsequent cardiac diagnostic tests, which may have low yield. It is also not in dispute that this is an area worthy of further investigation, and accordingly data are accumulating rapidly about the role of this test in clinical practice.

Against this very promising background information, the experience in many countries, including

Australia as well as Hong Kong, has been that the test has been introduced to the public with occasionally with aggressive marketing and advertising strategies, directed at the general community. This has sometimes occurred before the medical profession has accepted the benefits of coronary CT scanning. Publicity such as 'the most important advertisement you'll ever read' (or phrases similar) has appeared in high circulation newspapers and journals. Not surprisingly, the uptake rate by a public well educated and concerned about the dangers of heart disease has been high. Some subjects have been very relieved by early detection of a high calcium score and subsequent workup, others have been relieved by a reassuringly negative calcium score, but many have been worried by the news that they have 'coronary calcium', without a clear diagnostic or therapeutic pathway for them or their doctors to follow. Marketing direct to the public along these lines is contrary to the more traditional medical model with which doctors are comfortable, wherein evidence is carefully evaluated, learned societies and/or key opinion leaders come to a consensus, and then information is disseminated to the public through specialists, GPs and medically-based education.

Herein lies the genesis of some of the controversy surrounding coronary CT scanning. Those specialists involved in centres which have 'marketed' coronary CT scanning have been cast by some as 'irresponsible entrepreneurs' preying on the latent fears of a gullible public, whereas members of the profession who have adopted a more conservative stance can be cast as latter-day Luddites, delaying the uptake of promising new technologies which may have real health benefits, to the detriment of the general community. Such tensions often accompany the introduction of novel and exciting technologies, but can be particularly acute when significant sums of money can be made or lost, on the acceptance or otherwise of expensive new techniques.

A series of excellent review articles and letters have appeared in the Journal this year, commenting with different degrees of enthusiasm on the burgeoning use of electron beam CT for the non-invasive assessment

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of coronary artery calcium and its role in predicting coronary risk.²⁻⁴ These are all sensible and well-balanced viewpoints from highly regarded experts in the practice of cardiovascular medicine.

How then, to find perspective on this issue? This is an exciting area of research, about which we will all read more in the coming years. At the time of writing, the American College of Cardiology and the American Heart Association have produced consensus documents on electron beam CT for the diagnosis and prognosis of coronary artery disease, suggesting that this technique *not* be employed for non-invasive screening of asymptomatic subjects at risk of cardiovascular events.⁵ Newer data have since been published, however,¹ which may in time result in the revision of these recommendations, especially if similar results can be obtained in other supportive studies. As a community, we need to keep an open mind about such new data, whilst vigorously protecting our patients from unproven diagnostic and/or therapeutic strategies.

Some other questions need to be answered about coronary CT scanning. Firstly, cost/benefit analyses will be important in a cost-conscious era where other putative markers of coronary risk (such as high sensitivity CRP assays and ultrasound measurement of arterial wall thickness) may be considerably cheaper than CT scanning, and not carry any radiation risk. Secondly, are non-electron beam CT scanners as reliable, in the detection of calcium? Most importantly of all, cardiologists will want to have practical guidance on

which calcium scores in which patients should prompt which further diagnostic tests and/or treatment options.

This is an important topic, and the Journal is to be congratulated for publishing high quality articles, commentaries and letters on this subject. In the next 5 years, we will almost certainly find out whether coronary CT scanning for calcium is 'hype' or 'hope'. In the interim, a search for the right test for presymptomatic determination of coronary risk remains a 'Holy Grail' of internal medicine, as the worldwide prevalence of atherosclerotic disease continues its inexorable climb.

References

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