Two basic questions usually neglected: the definition of the technical parameters and contrast injection: reply

We thank Lee et al. for their interest in our work. The authors raise the point that the definition of pitch is table feed divided by total detector coverage. Although the focal spot motion increases the amount of samples acquired per projection, the detector coverage per rotation is still determined by the physical width of the used detector rows. Therefore, the physical coverage of the detector equals 19.2 mm based on 32 × 0.6 mm² detector collimation. The pitch used was 0.24 with a rotation time of 0.37 s, resulting in a table speed of 4.6 mm/rotation and 12.4 mm/s. Compared to the previous 16-slice CT scanners, this represents a significant enhancement of the table speed, thus reducing breath-hold times from 16 to 20 s with 16-slice CT scanners to ~10–12 s with the used 64-slice CT scanner.

The 64-slice CT scanner used has an adaptive array detector design with 40 detector rows, the 32 central rows having a collimated slice width of 0.6 mm and the eight outer rows a collimated slice width of 1.2 mm. For coronary CT angiography, all inner 32 detector rows are used.

We thank Lee et al. for their considerations about contrast injection technique. In our study, there was no dependency between the heart rate and the low vessel opacification in distal coronary segments. No segment down to the diameter of 1.5 mm had to be excluded from analysis because of poor image quality. Therefore, we consider our 64-slice CT protocol as highly robust and being diagnostic even in patients with no beta-blockers and high heart rates. It should be always aimed at an optimization of the contrast injection technique, particularly for improved visualization of distal segments in patients with higher heart rates. However, no systematic study verifying the assumption of Lee et al. has been published until now.

References


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Heart rate reduction through lifestyle modification

We read with great interest the article of Diaz et al. reporting on the long-term prognostic value of resting heart rate. In the accompanying editorial of Palatini, the role of heart rate as a strong predictor in subjects with coronary artery disease is emphasized. Palatini further points to the important fact that beta-blocking therapy in survivors of myocardial infarction or patients with congestive heart failure was effective only in subjects with high heart rates.
rate at baseline and was completely ineffective in those with low heart rate. Although it remains unclear whether beta-blocker therapy in coronary patients should be targeted according to pre-treatment heart rates, it is important to note that heart rate is also largely affected by lifestyle-related factors.

The decreased heart rate of endurance athletes is well known, and in recent studies on coronary patients, exercise therapy that led to meaningful, clinically beneficial effects was associated with significant heart rate reduction. In addition, high intake of docosahexaenoic n-3 fatty acid, an essential feature of the Mediterranean diet, is associated with decreased heart rate. Finally, sympathetic dominance with higher heart rates may be enhanced by anxiety and depression. Elicitation of the relaxation response and meditation have been shown to decrease adrenergic receptor sensitivity and to increase parasympathetic activity, thereby leading to reduction of heart rate. Therefore, in the clinical approaches to reduce heart rate in coronary patients, effective non-pharmacological options should also be considered.

Further studies may also clarify whether non-pharmacological heart rate reduction may have a comparable protective efficacy as that of beta-blocking agents in primary and secondary prevention of myocardial infarction.

References


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Heart rate reduction through lifestyle modification: reply

We thank Drs Michalsen and Dobos for their comments. Resting heart rate is indeed a strong predictor of mortality in patients with coronary artery disease. Experimental data have demonstrated that a reduction in heart rate can delay the progression of atherosclerosis in animal models. Atherosclerosis progression has also been shown to be predicted independently by minimum heart rate in men after myocardial infarction. Coronary artery endothelial cell dysfunction associated with high heart rates may represent an important mechanism for increased atherogenesis. In addition, a mean heart rate > 80 b.p.m. has also been shown to be associated with a higher risk of atherosclerotic plaque disruption.

Drs Michalsen and Dobos are correct in pointing out that the extent of heart rate reduction with beta-blockade is related to the decrease in cardiovascular events after myocardial infarction. We entirely agree with the relaxation response. Science 1982; 215: 190–192.

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