Assessment of Global Right Ventricular Function on 64-MDCT Compared with MRI

Cédric Plumhans¹, Georg Mühlenbruch¹, Annuar Rapae², Kui-Hian Sim², Tobias Seyfarth³, Rolf W. Günther¹ and Andreas H. Mahnken¹

¹Department of Diagnostic Radiology, RWTH Aachen University Hospital, Pauwelsstraße 30, D 52057 Aachen, Germany. ²Department of Cardiology, Sarawak General Hospital, Sarawak, Malaysia. ³Siemens Medical Solutions, Erlangen, Germany.

Abstract

OBJECTIVE. The aim of this study was to compare ECG-gated 64-MDCT with MRI for the assessment of global right ventricular (RV) function from coronary CT angiography data.

SUBJECTS AND METHODS. Thirty-eight patients (25 men, 13 women; mean age ± SD, 55.0 ± 8.8 years) with suspected coronary artery disease underwent contrast-enhanced 64-MDCT (64 × 0.6 mm, 120 kV, 770 mAs\textsubscript{eff}) and 1.5-T MRI (balanced fast-field echo; TR/TE, 3.3/1.6; flip angle, 60°; 50 phases). Double oblique short-axis MDCT and MR images were used for further analysis. End-diastolic volume (EDV), end-systolic volume (ESV), stroke volume (SV), and ejection fraction (EF) were computed from manually drawn endocardial contours of the right ventricle. For statistical analysis, repeated-measures analysis of variance and Pearson's correlation coefficients were calculated. Bland-Altman plots were computed.

RESULTS. In general, RV volumes calculated from 64-MDCT agreed well with those calculated from MRI. The mean EF (± SD) calculated from MDCT and MRI was 51.0% ± 7.8% and 51.4% ± 7.3%, respectively. An excellent correlation was observed for EDV (\(r = 0.99\)), ESV (\(r = 0.98\)), SV (\(r = 0.98\)), and EF (\(r = 0.97\)). Bland-Altman plots showed no systematic variation between MDCT and MRI data. No statistically significant differences (\(p ≤ 0.05\)) between the techniques were found.

CONCLUSION. Although contrast injection is optimized for visualization of the coronary arteries, retrospectively ECG-gated 64-MDCT permits reliable assessment of global RV function.

Keywords: cardiac imaging, heart disease, MDCT, MRI, right ventricular function

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