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Assessment of left ventricular function by gated myocardial perfusion and gated blood-pool SPECT: Can we use the same reference database?

Asit Kr. PAUL, Shinji HASEGAWA, Jun YOSHIOKA, Hitoshi YAMAGUCHI, Eiichiro TSUJIMURA and Tsunehiko NISHIMURA

Division of Tracer Kinetics, Biomedical Research Center, Osaka University Graduate School of Medicine

The purpose of this study was to compare left ventricular (LV) volume and ejection fraction (LVEF) measurements obtained with electrocardiographic gated single-photon emission computed tomographic (SPECT) myocardial perfusion imaging (GS-MPI) with those obtained with gated SPECT cardiac blood-pool imaging (GS-pool). Fifteen patients underwent GS-MPI with technetium-99m-tetrofosmin and GS-pool with technetium-99m-erythrocyte, within a mean interval of 8 ± 3 days. Eight patients had suspected dilated cardiomyopathy and seven patients had angiographically significant coronary artery disease. End-diastolic volume (EDV), end-systolic volume (ESV) and LVEF measurements were estimated from GS-MPI images by means of Cedars-Sinai automatic quantitative program and from GS-pool images by the threshold technique. Mean differences between GS-MPI and GS-pool in EDV, ESV and LVEF measurements were −2.8 ± 10.5 m*l* [95% confidence interval (CI): −8.6 ± 3.0 m*l*], 2.6 ± 7.3 m*l* (CI: −1.4 ~ 6.6 m*l*) and −2.3 ± 5.1% (CI: −5.1 ~ 0.6%), respectively. No significant difference in the mean differences from 0 was found for EDV, ESV or LVEF measurements. Bland-Altman plots revealed no trend over the measured LV volumes and LVEF. For all parameters, regression lines approximated lines of identity. The excellent agreement between GS-MPI and GS-pool measurements suggests that, for estimation of LV volumes and LVEF, these two techniques may be used interchangeably and measurements by one method can serve as a reference for the other.

Key words: left ventricular volumes, ejection fraction, gated SPECT, myocardial perfusion imaging, blood-pool imaging