Dynamic Diastologic Stress Echocardiography With Minimal Exercise Enables Prediction of Exercise Tolerance in Patients With Congestive Heart Failure

Toshinori Yasue, Yutaka Otsui, Bo Yu, Takeki Uemura, Kenichi Nakashita, Kunitsumi Takasaki, Yoshishisa Noguchi, Naso Mizukami, Yoshinori Morita, Tatsuyo Fukudome, Amede I Leque, Hiko Yuge, Yasuyoshi Katsuyama, Akiko Katsuragi, Shinichi Ikemura, Chiuchiu Tei, Kagoshima University School of Medicine, Kagoshima, Japan

Background: The most important factor to determine quality of life is exercise tolerance. It can be quantified with peak VO2 by analyzing patients' expired gas during carefully performed moderate or more exercise by skilled examiners. The purpose of this study is to investigate whether minimal exercise stress echocardiography allows noninvasive prediction of peak VO2 or not.

Methods: Subjects consisted of 10 patients with congestive heart failure of grade 2 to 3 of New York Heart Association's classification and 4 normal controls. Anaerobic threshold (AT) and peak VO2 was measured conventionally by analyzing expired gas during multiple step ergometer exercise. By minimal stress echocardiography with 10W exercise by ergometer, mitral flow velocity profile and its change relative to diastolic filling and atrial contraction was obtained and evaluated for luminal narrowing semiquantitatively. The results were not significantly correlated with AT and peak VO2. These findings suggest that LL maneuver can be useful as a simple preloading test and that this test may unveil the latent LV diastolic dysfunction in diabetic hypertensives, because a great shortening in DcT by LL over can be useful as a simple preloading test and that this test may unveil the latent LV diastolic dysfunction in diabetic hypertensives.

Conclusion: Dynamic diastologic stress echo with minimal exercise stress echocardiography with 10W exercise allows practical prediction of exercise tolerance in patients with congestive heart failure.

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The Accuracy of Multislice Spiral Computed Tomography Using a Novel ECG-Gated Image Reconstruction Method for the Assessment of Coronary Artery Stenosis

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We investigated the accuracy of multislice, spiral computed tomography (MSCT) to detect coronary artery disease in comparison with coronary angiography (CAG) using a new retrospective ECG-gated reconstruction method which minimizes cardiac motion artifact.

Method: 40 consecutive patients undergoing MSCT and CAG entered the study. MSCT was performed using a Somatom Zoom (Siemens, Germany) with collimation 1.0mm, pitch 1.5 and gantry rotation time 500msec. Metoprolol (20-60mg) was administered orally one hour prior to MSCT imaging in order to achieve the heart rate less than 64/min. The retrospective ECG-gated image reconstruction was performed with a data acquisition window (250msec) positioned immediately before atrial contraction in order to minimize motion artifacts caused by the abrupt diastolic ventricular movement during the rapid filling and atrial contraction periods. Following inspection of volume rendering images, mumpsar reconstruction images of the left main trunk (LMT), the left anterior descending artery (LAD), the left circumflex artery (LCX) and the right coronary artery (RCA) were obtained and evaluated for luminal narrowing semiquantitatively. The results were compared to those obtained by CAG.

Results: 152 (80%) out of 190 coronary arteries were free from motion artifact and eligible for evaluation. The remaining 38 arteries were excluded from the analysis because of severe calcification (n=4) and difficulty in breathhold (n=4). The sensitivity to detect coronary luminal narrowing greater than 50% was 100% for the LMT, 92% for the LAD, 85% for the LCX and 83% for the RCA. The overall sensitivity and specificity was 96% and 93%, respectively. Conclusion: Using a retrospective ECG-gated reconstruction technique which minimizes cardiac motion artifacts, MSCT provides excellent sensitivity and specificity for detecting coronary artery disease.