Ventricular Function Test: Gated Myocardial Perfusion SPECT versus Gated Blood-Pool SPECT and Planar Equilibrium Radionuclide Angiography

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Background: Equilibrium radionuclide angiography (ERNA) is well established and provides a relatively simple and noninvasive method to assess ventricular function. Gated blood pool SPECT (GBPS) has the benefit of the tomographic perspective to better isolate the left and right ventricles without overlap of other cardiac chambers for analysis of ventricular function. Gated myocardial perfusion SPECT (GMPS) provides the ability to assess both myocardial perfusion and ventricular function to further risk-stratify patients. However, the ventricular function derived from the three different methods varies much at a same patient, leading evaluation or follow-up difficult. The purpose of this study is to compare ERNA, GBPS and GMPS for the assessment of ventricular function and find a correlation among them.

Methods: Fifty-two patients collected from Jan. 2004 to Dec. 2004 were included. All patients received ERNA, GBPS and GMPS. Left ventricular ejection fraction (LVEF) was calculated and analyzed from the aforementioned three methods, and right ventricular ejection fraction (RVEF) was from ERNA and GBPS.

Results: The LVEF derived from ERNA, GBPS and GMPS were 53.86 ± 13.34%, 57.37 ± 18.07% and 61.88 ± 17.52%, respectively. The RVEF derived from ERNA and GBPS were 45.80 ± 8.59% and 53.17 ± 17.25%, respectively. The mean LVEF from GMPS was 8.02% and 4.51% higher than that from ERNA and GBPS (P < 0.001, GMPS vs. ERNA). The RVEF from GBPS was 7.37% higher than that from planar ERNA (P = 0.004). The LVEF from GMPS was significantly higher than that from ERNA (P < 0.001), except for the patients with dilated heart (P = 0.79).

Conclusion: The ventricular function derived from ERNA, GBPS and GMPS were different from each other. The LVEF from GMPS is strongly affected by the heart size. Knowing the differences among these data help to realize the actual ventricular function and serial evaluation of ventricular function in clinical patients.

Key words: equilibrium radionuclide angiography, gated blood-pool SPECT, gated myocardial perfusion SPECT, left ventricular ejection fraction


Assessment of ventricular performance is important in diagnosing and managing a wide spectrum of patients with heart disease. Radionuclide techniques provide highly accu-