

Changes with age in left ventricular function and volumes at rest and postexercise in postmenopausal women

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Objectives: In postmenopausal women, it has been reported that the plasma estrogen levels diminish immediately after menopause, and that this phenomenon affects left ventricular (LV) function and volumes. However, the effects of age on LV function and volumes for a relatively short period in the postmenopausal women remain to be established. Electrocardiographically gated-myocardial single-photon emission computed tomography (SPECT) has recently provided accurate estimations of perfusion, cardiac systolic and diastolic functions. We investigated the age-related changes in LV function and volumes in postmenopausal women using electrocardiographically gated-myocardial scintigraphy. **Methods:** Twenty-two consecutive healthy postmenopausal women (mean age of 63.8 ± 9.4 years, from 42 to 77 years) without cardiac disease underwent stress/rest technetium-99m tetrofosmin gated-myocardial SPECT with 16 frames per cardiac cycle at baseline and follow-up (1.0 ± 0.3 years later). LV ejection fraction (LVEF) and LV volumes were calculated by QGS software. Fourier series were retained for the analysis of the volume curve. From this volume curve, we derived the following diastolic indices: peak filling rate (PFR) and time to PFR (TPFR). **Results:** End-systolic volume index (ESVI) significantly decreased at postexercise ($p = 0.02$) and tended to decrease at rest ($p = 0.06$) from the baseline to the follow-up study. LVEF significantly increased at both postexercise ($p = 0.01$) and rest ($p = 0.03$) from the baseline to the follow-up study. The TPFR at rest tended to be prolonged from the baseline to the follow-up study ($p = 0.07$). The absolute increase in LVEF at postexercise tended to decrease with age [4.8% (50s) vs. 3.4% (60s) vs. 1.2% (70s)]. **Conclusions:** An age-related change in cardiac performance is apparent at an approximately 1 year follow-up in postmenopausal women. In particular, the increase in LV systolic function tends to show the greatest value in the 50s subjects among the 3 generations.

Key words: postmenopausal women, age, LV function, LV volume, quantitative gated-myocardial SPECT