

Assessment of left ventricular dysfunction by three nuclear imaging techniques

João Reis¹, Lidia Cunha¹, Pedro Costa¹, Diana Neves², Tânia Oliveira³, Ana Ferrer-Antunes³, Manuel Faria-João³ and Luis Metello¹

1 Nuclear Medicine Department, ESTSP.IPP, Vila Nova de Gaia, Portugal

2 Nuclear Medicine Department, Diaton Leiria, Sanfil Group & ESTSP.IPP, Leiria, Portugal

3 Nuclear Medicine Department, Diaton Leiria, Sanfil Group, Leiria, Portugal

Abstract

Objectives Nuclear imaging modalities include first pass radionuclide ventriculography (FPRV), multigated radionuclide angiography (MUGA) and gated blood-pool SPECT (GBPS) for monitoring of chemotherapy-related cardiomyopathy. The aim of this work is to correlate between these imaging techniques.

Methods 400mg of potassium perchlorate and 20 µg/kg of stannous agent were administered to a group of 30 patients (35–65 years old) 20 minutes before the iv bolus injection of 740–925 MBq of ^{99m}Tc. First pass images were acquired in anterior projection immediately after ^{99m}Tc injection, in a total of 1.500 frames with 25 msec/frame each. Fifteen minutes later, MUGA images were acquired in left anterior oblique projection for a minimum of 600 cardiac cycles using 24 bins/cycle. Finally, GBPS images were obtained using 24 bins/cycle and 20 cycles/projection in a total of 60 projections acquired over 180° in step-and-shoot mode. All images were acquired with a double-headed gamma camera, equipped with LEHR collimator. Left and right ventricular ejection fraction (LVEF and RVEF) as well as ventricular volumes were calculated.

Results 14 patients were analyzed. Global LVEF assessed by GBPS showed a good correlation with conventional planar methods (correlation coefficient = 0.87). The average LVEF obtained by planar techniques was $59.7 \pm 9.7\%$, whereas for GBPS was $66.2 \pm 10.4\%$. The correlation coefficient between MUGA and FPRV was 0.92. The average LVEF obtained by FPRV was $56.3 \pm 7.5\%$. The correlation coefficient between FPRV and GBPS was 0.81.

Conclusions Results obtained so far suggest a better correlation for LVEF between FPRV and MUGA techniques in comparison to GBPS. Moreover, GBPS provides additional information, since it allows the assessment of RVEF and wall motion, which can be of value in patients with congestive heart failure.