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## **COMPARISON AMONG DIFFERENT GATED MYOCARDIAL PERFUSION SOFTWARE AND ECHOCARDIOGRAPHY IN MEASURING THE LEFT VENTRICULAR EJECTION FRACTION**

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### **BACKGROUND-AIM**

Gated myocardial perfusion imaging (G-MPI) allows the evaluation of left ventricular ejection fraction (LVEF) in patients with suspected coronary artery disease (CAD). The aim of this study was to obtain the LVEF quantitative results of four commercially available software: quantitative gated single-photon emission computed tomography (SPECT) (QGS), Myovation, Emory Cardiac Tool Box (ECTb) and 4DM-SPECT, and to compare these results with LVEF calculated by echocardiography

### **METHODS**

76 patients with suspected or known CAD that underwent transthoracic echocardiography, were examined using rest G-MPI. The acquired and reconstructed data were processed using QGS, Myovation, ECTb and 4DM-SPECT software. Furthermore, we analyzed a subgroup of 28/76 patients with myocardial hypertrophy. We evaluated the Pearson's correlation between the LVEF calculated by the four software and by the echocardiography in the entire population and in subgroup. The Bland-Altman analysis was used to evaluate the difference of LVEF values obtained by four different software and echocardiography in both groups.

### **RESULTS**

In all study population LVEF values (mean  $\pm$  SD) calculated by QGS was  $55 \pm 18.2$ ; Myovation  $55 \pm 19.9$ ; ECTb  $63 \pm 18.2$ ; 4DM-SPECT  $61 \pm 18.1$ , by echocardiography was  $51 \pm 11.5$ . 28 patients were affected by myocardial hypertrophy. In this subgroup LVEF values (mean  $\pm$  SD) calculated by QGS was  $65 \pm 13.2$ ; Myovation  $66.8 \pm 12.5$ ; ECTb  $73.3 \pm 11.9$ ; 4DM-SPECT  $72.8 \pm 13$ , by echocardiography was  $56.8 \pm 6.2$ . In all population, good correlation was observed between QGS, Myovation, ECTb, 4DM-SPECT ( $r=0.83$ ) and echocardiography. Using the Bland-Altman analysis the differences within mean  $\pm 1.96$  SD are not clinically important, so the four methods may be used interchangeably respect to echocardiography. In patients with myocardial hypertrophy the correlation was lower between the four software and echocardiography ( $r= 0.69$ ). Using the Bland-Altman analysis the differences within mean  $\pm 1.96$  SD are slightly more relevant; the four methods in these patients overestimate the LVEF and a discrepancies were observed in patients with small ventricular volumes respect to echocardiography.

### **CONCLUSION**

The results of LVEF obtained by all software (QGS, Myovation, ECTb and 4DM-SPECT) provides high correlation among them and with echocardiography even if different LVEF values were obtained and the four methods resulted substantially equivalent. In patients with myocardial hypertrophy there is slight LVEF overestimation by the nuclear medicine software, particularly in patients with small ventricular volume.