Evaluation of LVEF in CAD: Comparison Study of GSPECT, 2D and 3D-Echo Techniques

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Left ventricular ejection fraction (LVEF) has major diagnostic and prognostic importance in patients with coronary artery disease (CAD). Different non invasive modalities, such as Gated SPECT (GSPECT), echocardiography are used to assess LVEF. The most common method for LVEF assessment is two dimensional (2D-ECHO) (Simpson), and, thus, it is often described in the literature and compared to GSPECT despite known inconsistencies in the results, obtained by this comparison. It is known that LVEF measurements by MRI or 3D ECHO are more accurate methods than 2D-ECHO. The aim of this study was to compare and to evaluate the agreement of LVEF evaluation by GSPECT, 2D-ECHO and 3D-ECHO in patients with suspected CAD. 19 ambulatory patients with suspected CAD referred to GSPECT by their cardiologist participated in the open-label, comparative, prospective study [mean age – 66Y; 8F,11M]. All patients underwent GSPECT, 2D-ECHO and 3D-ECHO for evaluation of LVEF on the same day. GSPECT was performed by 99M Tc-Sestamibi tracer using GE GSPECT gamma-camera. 2D-ECHO and 3D-ECHO were performed by Philips IE-33 machine by physician, who was blinded to the GSPECT LVEF results. Two-tailed t test and linear regression analysis were used for the comparison of data and correlation between 2D, 3D ECHO and rest GSPECT LVEF.

The mean LVEF measured by GSPECT, 2D-ECHO and 3D-ECHO was 51.6% ± 19.2, 50.2% ± 12.0 and 52.1% ± 12.3, respectively, range 15%-78%. All three methods were found to be comparable to each other ($p>0.05$). The correlation between GSPECT and 3D-ECHO ($r=0.81$, $p<0.01$) was found to be higher than between GSPECT and 2D-ECHO ($r=0.76$, $p<0.01$); the correlation between 2D and 3D ECHO ($r=0.78$, $p<0.01$) was found to be similar to correlation between GSPECT and 3D ECHO.

The present study demonstrated that the LVEF evaluation by the three methods has similar results. 3D ECHO LVEF measurement demonstrated the best correlation to the GSPECT LVEF measurement in suspected CAD patients.