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# ASSESSMENTS OF LEFT VENTRICULAR VOLUMES AND SYSTOLIC FUNCTION BY SINGLE CARDIAC CYCLE FULL VOLUME FOUR-DIMENSIONAL ECHOCARDIOGRAPHY IN PATIENTS WITH CHRONIC HEART FAILURE

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**Objective** To initial evaluate clinical applications of quantitative assessment left ventricular volume and ejection fraction (EF) by single cardiac cycle full volume 4-dimensional Echocardiography in patients with chronic heart failure.

**Methods** There were 33 patients with heart failure (CHF group) in study group and 30 healthy volunteers in control group (NOR group). Left ventricular end-diastolic volume (LVEDV), end-systolic volume (LVESV) and ejection fraction (EF) were measured by Teichholz method (ME), Simpson's

method (2DE) and 4-dimensional left ventricular analysis echocardiography (4D LVA) method, and then compared whether the indicators had differences.

**Results** In NOR group, LVEDV, LVESV, EF had no statistically significant difference among ME, 2DE and 4D LVA ( $p>0.05$ ). In CHF group, LVESV didn't have significant difference in three ways ( $p>0.05$ ); compared ME with 2DE and 4D LVA, the difference of LVEDV, EF was statistically significant ( $p<0.05$ ), difference of LVEDV, EF was not statistically significant between 2DE and 4D LVA ( $p>0.05$ ). In NOR group and CHF group LVEDV, LVESV, EF of 4D LVA had significant difference ( $p<0.05$ ). In NOR group, EF of ME, 2DE, 4D LVA had correlation ( $r$  were 0.955–0.927), while in CHF group ( $r$  were 0.885–0.967). EF measured by 4D LVA, coefficient variation of intraobserver and interobserver were 2.61%, 3.45%.

**Conclusions** Single cardiac cycle full volume four dimensional echocardiography doesn't need splice, the full volume of the heart images are completed at one heart beat. It quantitatively evaluates of left ventricular volume and ejection fraction (EF), gives rapid and feasible measurements of LV volume and EF, has a broad clinical application.