Three-dimensional echocardiographic characterization of patients with left ventricular non-compaction

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**Purpose:** despite several efforts have been performed by 2D-echocardiography (2DE) and cardiac magnetic resonance in the diagnosis of left ventricular non-compaction (LVNC), there are no universally accepted diagnostic criteria. The aim of our study was to describe the extent of non-compacted myocardium by a new 3D echocardiography-derived parameter.

**Methods:** 17 patients with an established diagnosis of LVNC based on 2DE and clinical criteria, 26 elite rowing athletes and 49 healthy volunteers underwent 3D echocardiography. By off-line analysis we calculated left ventricular volumes, mass, ejection fraction and sphericity index. Trabecular Volume (TV) was calculated as the difference between left ventricular end-diastolic volume obtained including and after excluding the trabeculae in the cavity contour. TV was also normalized by left-ventricular end-diastolic volume (TV%) (Figures).

**Results:** as shown in the graph, both the TV and TV% were significantly higher in LVNC (33.7±10.9ml and 24±7%) compared to controls (7.1±2.2ml, p<0.001; 6±2%, p<0.001) and athletes (8.0±3.0 ml, p<0.001; 5±2%, p<0.001). In detail, a TV > 15.8ml and a TV% >12.8% yielded a sensitivity of 100% and a specificity of 100% in the identification of LVNC (AUC=1.00). A mild positive correlation of TV and TV% was found with sphericity index (respectively r=0.294, p=0.004 and r=0.301, p=0.004) and negative correlation was found with ejection fraction (r=−0.454, p<0.001 and r=−0.217, p=0.038).

**Conclusions:** due to high spatial resolution and accuracy in volumetric quantification, 3D echocardiography allows accurate measurement of the extent of non-compacted myocardium and identification of LVNC patients.

Conflict of interest: Non declared