Assessment of left ventricular size and function by 3-dimensional transthoracic echocardiography: Impact of the echocardiography platform and analysis software

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Author(s) Castel, Anne Laure; Toledano, Manuel; Tribouilloy, Christophe; Delelis, François; Mailliet, Amandine; Marotte, Nathalie; Guerbaai, Raphaëlle A.; Levy, Franck; Graux, Pierre; Ennezat, Pierre-Vladimir; Maréchaux, Sylvestre
Author(s) at UniBasel Guerbaai, Raphaelle-Ashley ;
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Whether echocardiography platform and analysis software impact left ventricular (LV) volumes, ejection fraction (EF), and stroke volume (SV) by transthoracic tridimensional echocardiography (3DE) has not yet been assessed. Hence, our aim was to compare 3DE LV end-diastolic and end-systolic volumes (EDV and ESV), LVEF, and SV obtained with echocardiography platform from 2 different manufacturers.; 3DE was performed in 84 patients (65% of screened consecutive patients), with equipment from 2 different manufacturers, with subsequent off-line postprocessing to obtain parameters of LV function and size (Philips QLAB 3DQ and General Electric EchoPAC 4D autoLVQ). Twenty-five patients with clinical indication for cardiac magnetic resonance imaging served as a validation subgroup.; LVEDV and LVESV from 2 vendors were highly correlated (r = 0.93), but compared with 4D autoLVQ, the use of Qlab 3DQ resulted in lower LVEDV and LVESV (bias: 11 mL, limits of agreement: -25 to +47 and bias: 6 mL, limits of agreement: -22 to +34, respectively). The agreement between LVEF values of each software was poor (intraclass correlation coefficient 0.62) despite no or minimal bias. SVs were also lower with Qlab 3DQ advanced compared with 4D autoLVQ, and both were poorly correlated (r = 0.66). Consistently, the underestimation of LVEDV, LVESV, and SV by 3DE compared with cardiac magnetic resonance imaging was more pronounced with Philips QLAB 3DQ advanced than with 4D autoLVQ.; The echocardiography platform and analysis software significantly affect the values of LV parameters obtained by 3DE. Intervendor standardization and improvements in 3DE modalities are needed to broaden the use of LV parameters obtained by 3DE in clinical practice.
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