One- and two-dimensional estimation of right and left ventricular size and function—comparison with cardiac magnetic resonance imaging volumetric analysis

Heinz B Pfluger, Micha T. Maeder, Andre LaGerche & Andrew J Taylor

BACKGROUND: Estimations of right ventricular (RV) and left ventricular (LV) size and function based on 1D and 2D measures are commonly used. However, their correlation with volumetric analysis methods is not well documented.

METHODS: We analysed a series of subjects undergoing CMR (n=30). Contiguous short axis cine imaging was obtained to assess RV and LV volumes and function. Standard short and long axis cine imaging were performed to evaluate linear and planimetric dimensions as well as functional analysis.

RESULTS: Linear and planimetric measurements of the RV in standard long and short axis views correlated weakly with standard volumetric measurements (r=0.34-0.73). RV ejection fraction (EF), when calculated from single plane functional analysis correlated only moderately with the volumetric EF (r=0.75, p<0.001). In contrast, estimation of LV volumes, mass and EF by biplane area-length method demonstrated excellent correlation with volumetric data (r=0.89, 0.92 and 0.91, p<0.001 for all).

CONCLUSION: Two-dimensional estimations of volume and function correlate well with LV volumetric analysis, but not with RV volumetric analysis. Estimation of RV size and function based on linear or planimetric assumption models should be performed and interpreted with caution.