

P-157

Feasibility and reproducibility of new 3D automatic software for left heart chamber quantification in children.

*Hadeed K., Amadiou R.; Dulac Y.; Karsenty C.; Ratsimandresy M.; Acar P.
Department of Pediatric Cardiology, Children's Hospital, Toulouse, France.*

Introduction: New 3D automatic software (Heart model (HM), Philips Healthcare, Andover, Massachusetts) is now available to quantify left heart chamber size and function. Its feasibility and accuracy in children have not been reported. The aim of this study was to assess feasibility and reproducibility of HM in healthy children, and to compare LV indices obtained by this technique with classic 2D biplane method.

Methods: 60 consecutive healthy children aged more than 5 years were included (mean age 6.5 years, mean weight 20.8 kg). All infants underwent TTE (Epic 7, X5-1, Philips Healthcare, Andover, Massachusetts). Left ventricle (LV) end-systolic and end-diastolic volumes, LV ejection fraction (EF) and left atrium (LA) end-systolic volume were obtained by biplane Simpson method. 3D dataset was obtained from apical 4 chamber view and analyzed using HM software. LV indices obtained by the two methods were compared.

Results: Feasibility of HM was 80%, in 30 cases (62.5%) with contour adjustment and 18 cases (37.5%) without contour adjustment. Intraobserver variability was (0 %, 4% and 8% for HM without contour adjustment, HM with contour adjustment, and biplane method respectively). Interobserver variability was (6% and 12% for HM with contour adjustment and biplane method respectively). Test-retest variability for HM was 6.5%. Correlation between HM and biplane measurements were strong ($r= 0.85$ to 0.94). LVEF obtained by HM was lower than that obtained by biplane method (bias -8%). However LV volumes and LA end-systolic volume were larger (bias +12 and +8 respectively).

Conclusion: HM is a promising software for assessment of left heart chamber volume and function. Its feasibility in infants aged more than 5 years is good with excellent reproducibility. Working is going on to validate this technique in children with congenital heart disease and to compare it with MRI measurement as the gold standard.