Determination of right ventricular size parameters using 2D echocardiography in children with an atrial septal defect: ready for clinical use?


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Introduction: Determination of right ventricular (RV) size and function has gained more interest during recent years in both adults and children, especially in patients with congenital heart disease. We investigated growth related changes of RV internal dimensions in a healthy pediatric cohort and the predictive value of RV parameters in identifying enlarged RVs in children with a secundum type atrial septal defect (ASD) to investigate for a possible use in clinical use.

Methods: A prospective study was conducted in a group of 576 healthy children and 37 children (age range: 1.4 – 17.7 years) with a moderate-sized to large ASD. We determined the effects of age, body length (BL), body weight (BW), and body surface area (BSA) on RV parameters: end-diastolic basal-diameter (EDb-d), end-diastolic mid-cavity diameter (EDm-d), end-diastolic length (EDL), end-systolic length (ESL), end-diastolic area (EDA), and end-systolic area (ESA). The predictive value of normal values stratified for age, BW, BL, and BSA was tested in our ASD children.

Results: RVEDb-d, RVEDm-d, RVEDL, RVESL, RVEDa, and RVESA showed a positive correlation with age, BL, BSA, and BW. RV z-scores showed a high specificity for detecting ASD patients with sensitivity up to 89%, especially in ASD children below eight years of age.

Conclusions: We could identify enlarged RV diameters of our ASD patients compared to age-related normal RV parameter z-scores, especially in children below eight years of age. This may be useful to guide decision making in ASD patients for timing interventional or surgical closure.