Reference values of the right ventricular outflow tract systolic excursion (RVOT SE) in 711 healthy children and calculation of z-score values

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Objective: Determination of right ventricular (RV) function has gained more interest in the last years. The RV outflow tract systolic excursion (RVOT SE) has been recently introduced as an echocardiographic tool to assess RV systolic function in adults. We aimed to determine growth related changes of RVOT SE in children to establish references values.

Methods: A prospective study was conducted in a group of 711 healthy pediatric patients (age: day 1 to 18 years), (BSA: 0.14 to 2.26 m²). We determined the effects of age and body surface area (BSA) on RVOT SE values. RVOT SE values were also correlated with established RV systolic function parameters tricuspid annular plane systolic excursion (TAPSE) and tricuspid annular peak systolic velocity (S').

Results: The RVOT SE ranged from a mean of 3.9 mm (± 3 SD: 1.5 – 6.4 mm) in neonates to 9.5 mm (± 3 SD: 5.7 – 13.3 mm) in 18 year old adolescents. The RVOT SE values showed a positive correlation with age (r= 0.90, p <0.001) and BSA (r= 0.91, p <0.001). No significant difference in RVOT SE values between females or males was found (p = 0.707). A positive correlation was seen between RVOT SE and TAPSE (r = 0.83, p <0.001) and between RVOT SE and S’ (r = 0.86, p <0.001)

Conclusions: Z-scores of RVOT SE values were calculated and percentile charts were established in the pediatric age group. RVOT SE provides a simple measure and, in combination with RV long-axis excursion parameters TAPSE and S’, provides comprehensive assessment of RV systolic function.