

VENDOR INDEPENDENT MYOCARDIAL STRAIN REFERENCE VALUES IN CHILDREN

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April 6, 2022

Abstract

Background Two-dimensional (2D) strain imaging has become an important tool in assessing subclinical myocardial dysfunction in children. However, there are no pediatric reference values for vendor independent strain software. The aim of this study was to estimate 2D strain values in a cohort of healthy children using Tomtec cardiac performance analysis (CPA), a vendor independent software. **Methods** Transthoracic echocardiograms of healthy pediatric outpatients (0-18yrs) were retrospectively analyzed from the Vanderbilt Pediatric Heart Institute using CPA. Cardiac assessment included global longitudinal strain (GLS), global longitudinal strain rate (GLSR), global circumferential strain (GCS), global circumferential strain rate (GCSR). Mean strain values with standard deviation (SD) are reported. The Wilcoxon rank sum test, linear regression and one-way analysis of variance were used to assess differences among the various groups. **Results** Among 142 children analyzed, 79 (56%) were male, and the median age was 5.5 (range, 0-18) years. The mean (SD) strain values were GLS -19.3 ± 3.4 , GLSR -1.1 ± 0.22 ; GCS -24.7 ± 4.3 , GCSR -1.5 ± 0.28 . Age accounted for $<8\%$ of variation in GLS, GCS and GCSR. However, for GLSR, there was a statistically significant difference between younger and older age groups with higher GLSR in the younger age group. Age accounted for $\sim 25\%$ of variation in GLSR ($R^2 = 0.25$, $P < 0.001$). There were no significant differences in strain based on sex. **Conclusion** We report normal reference values in healthy children by age for strain using CPA. These values are necessary for the interpretation of 2D strain imaging for both clinical care and research.

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